CLAIMS

What is claimed is:

1. A beam integrator comprising:

a laser diode array, where the diode array contains a plurality of emitters; and

an optical array, where the optical array is composed of optical array elements, each optical array element associated with an emitter, where each emitter emits an associated beam making a plurality of beams, where the optical array integrates the plurality of beams into fewer beams of increased relative intensity.

2. The integrator of claim 1, wherein the optical array element is an asymmetric prism.

3. The integrator of claim 1, wherein the optical array element is a dove prism.

4. The integrator according to claim 3, further comprising:

an integrator lens

5. The integrator according to claim 4, further comprising:

an anamorphic lens, which further integrates the fewer beams.

6. The integrator according to claim 3, wherein the dove prisms are arranged linearly.

7. The beam integrator according to claim 3, wherein the dove prism has a general trapezoidal shape.

8. The beam integrator according to claim 1, wherein at least one of the optical array elements has positive optical power.

9. The beam integrator according to claim 4, wherein the integrator lens has a height which is equal to or greater than the height of the optical array.

10. A beam integrator system comprising:

a laser diode located near the first end of a housing structure;

a plurality of emitters which are positioned in an end-to-end position with respect to one another and located within the laser diode;

a plurality of microlens, wherein each microlens is attached and aligned with one of the plurality of emitters;

a plurality of dove prisms which are positioned in an array and wherein each of the dove prisms are respectively aligned with each corresponding emitter and a microlens; and

an integrator lens.

11. A method of integrating a plurality of beams to form a beam with a near circular cross-section, comprising:

rotating beams by an angle to obtain associated rotated beams, wherein the beams are generated by a plurality of emitters, and where the rotating step is performed by an array of optical elements;

combining the associated rotated beams by passing the associated rotated beams through a positive lens to form at least one combined beam; and

varying the cross section of the combined beam, by passing the at least one combined beam through an anamorphic lens.

12. the method according to claim 11, wherein the optical element is a dove micro-prism.

13. An optical device emitting coherent energy in a single collimated beam comprising:

an array of laser emitters arranged with a regular and predetermined pattern and spacing;

a microlens array having:

a plurality of incident micro-lens each corresponding to a said laser emitter and collectively having a pattern and spacing complementary to the predetermined pattern and spacing of the laser emitters for focusing the energy emitter from said laser emitters; and

additional microelements collimating the energy emitted by said laser emitters and focused by said incident micro-lens to produce a collimated and phase

coherent combination of the outputs of each of said laser emitters to decrease the size of and increase the concentration of the emitted coherent energy.

14. The optical device of claim 13, wherein each said additional micro-lens has a focal point which is dependent on its position within said micro-lens array to focus the energy incident thereon on a single focal point.

15. The optical device of Claim 14, wherein each of said additional microelements correspond to an associated laser emitter and incident micro-lens.

16. The optical device of Claim 13, wherein each said additional microelements has a focal point which is dependent on its position within said micro-lens array to focus the energy incident thereon; said optical device further comprising an integrator lens receiving the output of said micro-lens array on a single focal point.